

Caregivers' Perception of Unintentional Child and Adolescent Injuries in Enugu, Nigeria

Christopher B. Eke, Obianuju O. Igbokwe, Vivian O. Onukwuli*

Department of Paediatrics, College of Medicine, University of Nigeria Enugu Campus/University of Nigeria Teaching Hospital, Ituku/Ozalla, Enugu

Email: Christopher.eke@unn.edu.ng, obianuju.igbokwe@unn.edu.ng, *vivian.onukwuli@unn.edu.ng

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Abstract

Background: Injury is an increasing cause of childhood morbidity and mortality globally. **Purpose:** The objective of the study was to evaluate caregivers' perception of unintentional child and adolescent injuries in Enugu. **Methods:** This was a cross-sectional descriptive study. Data were collected from caregivers of children attending the children's outpatients' unit of the hospital during the period of the study, who were selected consecutively using semi-structured interviewer administered questionnaire. Data were analysed using SPSS version 20.0. The level of statistical significance was set at $p < 0.05$. **Results:** A total of 728 caregiver-child pairs were interviewed, out of which 526 (72.3%) recalled history of injuries in their wards within the past 12 months. Most of the injuries occurred at home (334; 63.5%), in males 329 (62.5%), and in the 1 - 4 years age group 239 (45.4%). On further analysis, age of the child, male sex, residence in rural area and stage of child's development significantly predicted the risk of having an unintentional injury. Majority of the interviewees had heard of first aid (432; 59.3%) though only a few 23 (5.4%) actually owned well equipped first aid boxes. Most of the respondents felt that injuries in children were preventable, 429 (58.9%). However, a good number agreed that they needed clear education on preventive measures of childhood injuries, 485 (66.6%). **Conclusion:** Unintentional injuries occur commonly in children and are largely preventable. Appropriate health and environmental education is needed to reduce the rising incidence of injuries in children in our setting.

Keywords

Childhood Injuries, Caregivers' Perception, Nigeria

1. Introduction

Childhood injuries are an increasing global public health burden. With im-

proved and widespread global immunization strategies for various childhood killer infectious diseases, injuries are now reported as the world's leading cause of morbidity and mortality in children [1] [2]. Nearly 950,000 children under the age of 18 years die annually from injury or violence [2] [3]. It has been reported that 90 percent of these deaths amounting to about 830,000 cases are as a result of unintentional injuries and this equals the number of children dying from complications of some common vaccine-preventable diseases including measles, diphtheria, polio, whooping cough and tetanus combined [4].

Domestic injuries including cuts, falls, burns, poisoning, animal/insect bites; injuries occurring at school, workplace injuries, injuries due to war and conflict including insurgency, and child abuse contribute to the total burden of injuries among children [1] [3], with majority occurring at home [5] [6].

Majority of these injuries occurring in children are due to unintentional mechanisms [1] and these injuries pose a big threat to child health, with causing significant economic, psychological burden and loss to the affected families and the nation at large [7].

In addition to mortality arising from these childhood injuries, millions of affected children often require hospitalization for care of non-fatal cases, with many left with various forms of disability and/or chronic pain, [8] which limit their performance of daily activities [8].

It has been reported that cases of childhood injuries particularly road traffic crashes and falls constitute the leading causes for Disability-Adjusted Life Years (DALYS) lost for children [9].

In many African countries including Nigeria, injuries rank among the top common contributors of child and adolescent mortality [10] [11] [12] [13] [14].

Evidence suggests that majority of childhood injuries are largely preventable following implementation of effective intervention models [8].

Countries that have recorded remarkable achievements in child and adolescent injury prevention have put in place a combination of multi-sectoral policies and programme to reduce childhood injuries among their population. These include legislation and enforcement, product modification, environmental modification, home visitation, safety devices, continued education, care and rehabilitation of injured children among others [4].

The World health organization and the United Nation's Children Fund and other governmental and non-governmental organizations have been in the forefront of providing policies, guidelines, training and support with regards to prevention of childhood injuries globally [15] [16]. With about 98 percent of unintentional childhood injuries reported from low and middle-income countries [17], who are still grappling with severe infrastructural and human capacity deficits, there is urgent need to determine the pattern and determinants of childhood injuries in our setting.

There is paucity of national epidemiological data on the magnitude of childhood injuries including fatal and non-fatal cases in our setting, with many seek-

ing care from informal medical care including patent medicine vendors/dealers and traditional healers leaving only a few especially the severely injured presenting to hospitals [12].

Hence the objective of the current study was to determine the caregivers' perception of unintentional child and adolescent injuries in Enugu, Nigeria.

2. Methods

2.1. Study Setting

This study was conducted at the children's Outpatient Unit of the Department of Paediatrics, University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu, Nigeria.

UNTH is a 750-bed capacity tertiary hospital situated at Ituku-Ozalla in Enugu State Southeast Nigeria. About one hundred and twenty children are seen in the outpatient department of the hospital on each working day Mondays through Fridays.

2.2. Study Design

This was a cross sectional descriptive study involving caregivers' of children attending the children's outpatient Unit of the Department of Paediatrics, UNTH, Ituku-Ozalla, Enugu, Nigeria.

2.3. Ethical Concerns

Study ethical approval was sought and obtained from the Health Research and Ethics Committee of University of Nigeria Teaching Hospital, Enugu (NHREC/05/01/2008B-FWA00002458-IRB00002323). Informed written consent was also obtained from all the respondents prior to recruitment into the study.

2.4. Inclusion Criteria

Respondents were caregivers of children including those whose child/children may or may not have sustained injuries previously and attending the children's outpatients' unit of the hospital during the period of the study. They gave their informed written consent and were consecutively recruited into the study.

2.5. Exclusion Criteria

Caregivers who did not give their consent for the study were not recruited.

2.6. Questionnaire Design

The study was undertaken using a semi-structured interviewer-administered pre-tested questionnaire designed for the study which was adapted from similar previous studies [12] [18].

2.7. Conduct of the Study

The study was conducted from 1st February to 31st March, 2019. The designed

questionnaire was pre-tested among mothers attending the children's outpatient unit and the content found to be unambiguous prior to the commencement of the study.

The respondents selected for the pre-test were excluded from the actual study.

The questionnaire sought to determine the socio-demographic characteristics of the respondents including age of caregiver, child's age in years and sex, place of residence, highest educational attainments and occupations of the parents from which the social class was determined. Others include the caregivers views on basic risk factors for childhood injuries (age of child, sex of child, child's stage of development, illness of the caregiver, child visiting a new environment), characterization and outcome of unintentional injuries in children (history of injury in the child, type of injury sustained, anatomic part of the body involved and its severity), treatment given with outcome of the injuries among the children as well as knowledge and usage of first aid box among caregivers.

2.8. Social Class Determination

The social class of each child was determined using the method advanced by Oyedeji [17] among a population of Nigerian children. Here, the social class of each child was obtained with the highest educational attainment and occupation of the mother and father combined. The average of the four scores (two each for the father and mother respectively, that is, occupational status and highest educational attainment) to the nearest whole number was assumed as the social class of each child studied. The highest score is 1 while the lowest is 5. Social classes I and II; III; IV and V were classified as high, middle, and low socioeconomic class respectively. In the situation where one of the parents is late, the social class of the child is then determined using only that of the surviving parent.

Definition of term: Child unintentional injury: is a non-purposeful damage or physical trauma occurring in a child [1].

2.9. Data Analysis

The data were analysed using statistical package for social sciences (SPSS) version 20.0 Chicago Il. The level of statistical significance was set at $p < 0.05$.

3. Results

A total of 728 caregiver-child pairs were interviewed. Of these, 371 (51%) were males, while 357 (49%) were females. The mean age of the children was 5.9 ± 4.37 years, while the mean age of the caregivers (mothers) was 33.96 ± 6.73 years.

Majority of the respondents resided in apartments and public yards (505; 69.4%) while the rest resided in private houses (187; 25.7%). Also, most of the interviewees resided in rural areas 378 (51.9%) while 350 (48.1%) lived in urban locations as shown in **Table 1**.

All the caregivers studied were mothers and 98 (13.4%) of them had either no formal education or primary education as their highest educational level whilst

630 (86.5%) had secondary education and higher.

A greater number of the respondents were of the working class, either civil servants (239; 32.8%), self-employed (294; 40.4%) or privately employed (8; 1.1%) while 187 (25.7) of them were unemployed. Majority of the respondents were of lower socio-economic class (482; 66.2%). See **Table 1**.

Of the 728 respondents, 526 (72.3%) recalled history of injuries in their children/wards within the past 12 months and about a quarter reported that a child was injured more than once. Most of these injuries occurred at home (334; 63.5%), while the rest occurred at school, along the road and in the neighbourhood (184; 35.9%).

Of the children reported to be injured, 329 (62.5%) were males while 197 (37.5%) being females.

Table 1. Socio-demographic characteristics of caregivers and their children pairs.

Features	Frequency N = 728	N%
Sex		
Male	357	49.0
Female	371	51.0
Place of Residence		
Rural	378	51.9
Urban	350	48.1
Maternal Education		
No Formal Education	12	1.6
Primary	86	11.8
Secondary	230	31.6
Diploma	129	17.7
Degree	271	37.2
Maternal Occupation		
Housewife/Unemployed	187	25.7
Self-Employed	294	40.4
Privately Employed	8	1.1
Government Employee	239	32.8
Social Class		
1	8	1.1
2	43	5.9
3	195	26.8
4	325	44.6
5	157	21.6
Mean Age of Children (in Years)	5.96 ± 4.37	
Mean Age of Mother (in Years)	33.96 ± 6.73	

The injury occurred mainly in the 1 - 4 years age bracket 239 (45.4%) followed by the 5 - 9 years 164 (31.2%), 10 - 18 years 65 (12.4%) and infants 58 (11.0%) respectively.

The most important risk factors for injuries were age of the child 624 (85.7%), sex of the child 589 (80.9%), child's stage of development 526 (72.3%). Other risk factors were nature/location of residence 457 (62.8%), climbing of heights 129 (17.7%) and overactivity 92 (12.6%) as shown in **Table 2**.

Falls were the commonest cause of these injuries (362; 68.8%), followed by cuts/lacerations (87; 16.5%), burns (30; 5.7%) and road traffic crashes (27; 5.1%) as shown in **Table 3**.

The limbs (lower limbs) were commonly affected (288; 54.8%), followed by the head and neck (140; 26.6%). In 63 of the cases, multiple sites were affected (12%). Chest and abdominal injuries were also seen in 35 (6.6%) of the cases. See **Table 3**.

On further statistical analysis using bivariate analysis the age, male sex, resident in rural area and the child's stage of development significantly predicted the risk of a child having an unintentional injury as shown in **Table 4**.

Majority of the interviewed caregivers had heard of first aid box (432; 59.3%) and their main source of information was from health workers (297; 69.2%). However, only 23 (5.4%) actually owned well equipped first aid box and used it (see **Table 5**).

The observed sources of treatment for these injuries were at home (199; 37.8%), and in 80 of the cases (15.2%) no treatment was administered. Some of the respondents patronized traditional and patent medicine vendors (92; 17.4%), while 155 (28.9%) visited hospital and primary health centres.

Of those that visited the hospital, 58 (11%) were hospitalized for non-fatal injuries and of these, 50 (86.2%) were treated and discharged without disability, 3 (5.2%) recovered with disability while 5 (8.6%) died as a result of the injuries. The disabilities recorded were above knee amputation of a leg, 2 (66.7%) and chronic pain, 1 (33.3%) as shown in **Table 6**.

Table 2. Caregivers views on basic risk factors of childhood injuries*.

Characteristic	Frequency (N = 728)	Percent (%)
Age of Child	624	85.7
Sex of Child	589	80.9
Stage of Development	526	72.3
Nature/Location of Residence	457	62.8
Climbing of Heights	129	17.7
Overactivity	105	14.4
Illness of Caregiver/s	92	12.6
Change of Environment	63	8.7

*Multiple entries allowed.

Table 3. Characterization and outcome of unintentional injuries in children.

Features	Frequency (N = 728)	Percent (%)
History of Injury:		
Yes	526	72.3
No	202	27.7
Place of Occurrence (n = 526):		
Home	334	63.5
School	99	18.8
Neighbourhood	57	10.8
Roadways	28	5.3
Others	8	1.5
Cause of Injury (n = 526):		
Falls	362	68.8
Cuts/Lacerations	87	16.5
Burns	30	5.7
Road Traffic Accidents	27	5.1
Poisoning	8	1.5
Fractures	4	0.8
Electrocution	4	0.8
Drowning	3	0.6
Foreign Body Aspiration	1	0.2
Anatomic Region Affected (n = 526):		
Limbs	288	54.8
Head and Neck	140	26.6
Multiple Sites	63	12.0
Chest Injury	27	5.1
Abdominal Injury	8	1.5

Table 4. Bivariate analysis of the risk factors of childhood injuries.

Risk Factors	Correlation Coefficient	p-Value
Age	-1.293	0.009*
Sex	0.596	0.043*
Place of Residence	0.623	0.039*
Maternal Education	-0.080	0.835
Social Class	0.007	0.978
Child's Stage of Development	0.401	0.047*

Table 5. Caregivers perception and usage of first aid box.

Features	Frequency (N = 728)	Percent (%)
Heard of First Aid Box (n = 728):		
No	296	40.7
Yes	432	59.3
Source of Information: (n = 429)		
Health Workers	297	69.2
Friends/Relations	89	20.7
Media	43	10.0
Ownership of Well-Equipped First Aid Box: (n = 429)		
Yes	23	5.4
No	406	94.6

Table 6. Treatment and outcome of physical injuries among the children.

Features	Frequency (N = 728)	Percent (%)
Source of Treatment (n = 526):		
Home Treatment	199	37.8
Hospital (Public/Private)	130	24.1
No Treatment Given	80	15.2
Patent Medicine Vendors	76	14.4
Primary Health Centre	25	4.8
Traditional Healer	16	3.0
Need for Hospitalization:		
Yes	58	11.0
No	468	89.0
Outcome of Injury in Hospitalized Children (n = 58):		
Treated and Discharged without Disability	50	86.2
Recovered with Disability	3	5.2*
Demised	5	8.6

*Pattern of disability: above knee amputation of a leg 2 (66.7%); chronic pain, 1 (33.3%).

Majority of the respondents are of the opinion that injuries in children are preventable, 429 (58.9%). Also, most of the caregivers felt that they needed clear education about preventive measures of paediatric injuries, 485 (66.6%) whereas 243 (33.4%) felt that most child injuries are destined to happen by nature.

4. Discussion

Injuries have been reported as one of the leading causes of morbidity and mortality in children and adolescents globally [2]. The current study has explored caregivers' perception of unintentional injuries in children in our setting.

Majority of the respondents who are mothers of the children involved in the injuries actually understood the actual meaning of childhood unintentional injury.

A staggering high number of the interviewees recalled different forms of injuries in their wards in the last 12 months occurring once or more times. A similar finding was reported by Abdur-Rahman *et al.* [12] in a community survey of childhood injuries in North-Central region of Nigeria.

From the study the major determinants risk factors for injuries in a child were the age, male sex, being resident in a rural area, and child's stage of development as corroborated by other workers [1] [10] [20].

Age was a determinant factor of injuries among the study population with most occurring in children between the ages 1 to 4 years. Most children between toddlerhood and preschool age tend to be exploring the environment as well as trying new games and climbing heights hence chances are that these groups of children are more predisposed to having injuries as observed in the current study and similar researches [12].

The males also tended to be more involved in injuries as equally observed in the current study cohort. The boys were more autonomous and it is possible that the male gender specific impulsive behavior such as rough play and taking risks including getting involved in dangerous games are believed to account for more males to be involved in different forms of injuries. This has been corroborated by other workers [2] [19] [20] [21].

Domestic environment could play a significant role particularly in-home accidents [5], and poisoning [5]. In the current study, the nature/place of residence significantly determined a child's proneness to injury as most of the injuries occurred in children living in rural areas with possibility of overcrowding and lack of safety devices in the households. A child health and injury survey in Bangladesh showed that children living in homes with exposed wires in the houses who were mostly rural dwellers tend to have more mortality following electrocution [22]. Similar studies have posited that children resident in rural areas tended to be of lower socioeconomic background with increased likelihood of poor environmental infrastructure and as such more exposed to injuries as seen in the present study [23] [24].

Studies have alluded to the fact that the stage of child's development significantly determines the chances of sustaining/being involved in an injury as children are not generally aware of the risks and consequences of the common injuries [3], particularly when taking risks.

Majority of the caregivers in the present study were mothers with at least secondary education. However maternal education did not significantly predict the risk of childhood injury (correlation coefficient, $r = -0.080$; p -value 0.835) which is at variance to findings in other studies that observed that higher parental education correlates with lower incidence of childhood injury [25] [26].

Falls ranked the most common cause of injury in the current study followed by cuts/lacerations, road traffic injuries and burns. A similar pattern of uninten-

tional child injuries have been observed in different childhood populations [3] [27] [28] [29].

Most of the injuries reported affected the limbs particularly the lower limbs as have been observed in similar studies [12].

Among the study population who had sustained one type of injury or the other, 11% (58) of them needed hospitalization for continued care out of which seven died (12.1%) as reported by the respondents. However, it was observed that a significant number still patronize patent medicine vendors and traditional healers including native bone setters who may not be well trained to assess injured patients to determine those that needed specialized care or even manage them adequately thus increasing the risk of morbidity and mortality in them.

Some local hospital studies [30] [31], on childhood injuries have shown the pattern and outcome of children with injuries including hospitalization rates and many reporting high mortality rates. Late presentation possibly arising from patronization of traditional healers, patent medicine vendors and poverty could account for some of the high mortality rates in some of the studies in our locale including the current study [30] [31] [32] [33].

A non-fatal injury in children is an increasing cause of morbidity in children particularly those between one to four years with many having lifelong disabilities or chronic pain that may impact negatively on performance of daily activities. [8] Three (5.2%) of the 58 (100.0%) hospitalized children in the current study recovered with different disabilities ranging from amputation of the legs and mal-union. Also, most disabilities occurring in early life tend to impact on the child's overall growth and development including self-care, mobility, psychosocial functioning [3], in addition to the resulting huge economic burden both on the families and the government health budget [34].

Generally non-fatal injuries could impact negatively on productivity and economic cost and in some cases ownership and use of appropriate first aid could improve the outcome of the injury when applied early and may help to save lives [35], particularly in those living in remote areas where most of these injuries occur [23] [24]. Such a first aid could be applied to the injured while efforts are being made to transfer the wounded to the referral hospital. The International Federation of Red Cross and Red Crescent (IFRC) states that though first aid is not a substitute for emergency health services, it is a key primary strategy for providing effective and rapid interventions to reduce severe injuries and improve survival [35]. Observation in the current study showed that though a substantial number of the interviewees have heard of first aid box only a fraction of them actually owned a well-equipped first aid box and used it. Hence, to obtain the desired outcome following the use of first aid it should be instituted immediately following the occurrence of an injury.

From the current study majority of the respondents are of the opinion that childhood unintentional injuries are largely preventable, however clear and specific health education is needed in order to stem the tide of this challenging sit-

uation. The World Health Organization (WHO) has recommended a set of preventive measures covering legislation, regulations by the national governments, changes of environmental education and emergency medical care. These emergency care as being pushed by the WHO is the Emergency and Trauma Care-WHO Global Alliance for care of the injured (GACI) and is aimed at saving millions of lives and minimizing the consequences of injuries by strengthening trauma care systems. Also other similar efforts to improve care of the multiple injured include the training on advanced/ Paediatric life support (APLS).

Comprehensive Paediatric guidelines on the management of the multiply injured child are still lacking in most countries in sub-Saharan Africa. Hence there is a need for articulation of regional and national guidelines for emergency medical care of the multiple injured in our setting.

Appropriate health and environmental education, targeted government policies, legislation and institution of standardized emergency and trauma care for the multiple injured is needed to stem the tide of childhood injuries in our setting.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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